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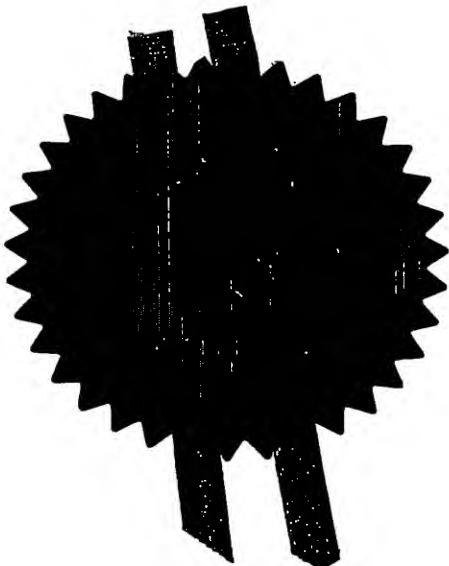
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26 JUN 2003

## 3. Full name, address and postcode of the or of each applicant (underline all surnames)

Flexipol Packaging Ltd  
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Lancashire  
BB4 6HH

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

GB 7473879001

## 4. Title of the invention

Improvements in Bags and Sacks

## 5. Name of your agent (if you have one)

Harrison Goddard Foote

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

Belgrave Hall  
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7621310002  
14571001

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Continuation sheets of this form

Description

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Claim(s)

5

Abstract

1

Drawing(s)

2

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Priority documents

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Statement of inventorship and right to grant of a patent (Patents Form 7/77)

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Nigel Sanderson

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## Improvements in Bags and Sacks

5 The present invention relates to bags and sacks and in particular to plastic bags and sacks for use in the food and pharmaceutical industries, especially for the storage and transport of powdery or granular materials or the like.

10 The food and pharmaceutical industries necessarily place stringent requirements on the handling of ingredients and components, as well as on final products sold to commercial users and consumers. These requirements are essential to prevent contamination with dust, dirt or other foreign bodies or with, for example, bacteria. Conventional bags and sacks have tended to use at least one layer, usually an outer layer, of a paper material which is closed by stitching. This sort of construction has the significant disadvantage that, on opening of the bag, pieces of paper or stitching 15 thread may contact and become mixed with the contents of the bag. Other bags are made of plastics material and suffer a similar problem in that the closure of the bag often requires the bag to be cut open to access the contents. This carries the danger that shards of plastic from the cutting step can contact the bag contents.

20 The present invention seek to overcome these problems by providing a plastic bag or sack with an easy open closure which does not require any cutting and which does not generate any loose pieces or shards of plastic or other material on opening. More specifically, the present invention provides a bag comprising an inner bag section and an outer bag section both sections being closeable after the inner section is filled with 25 contents and the inner bag section being removable from the outer bag section without disrupting the closure of the inner bag section.

According to a first aspect of the present invention there is provided a plastic bag comprising:

30 i) a first bag section comprising first and second opposed walls joined at their edges;

- ii) a second bag section disposed within the first bag section and comprising second and third opposed walls joined at their edges and an open end by means of which the second bag portion may be filled with contents;
- iii) a closeable mouth defined in the first wall for access in use to the interior of the first bag section;
- iv) a closeable region distinct from the mouth including an end portion of the first bag section and an end portion of the second bag section proximate the open end of the second bag section, within which closeable region the second bag section may be sealed after filling;

10 wherein, in the closeable region, an internal face of at least one of the respective first and second walls of the first bag section is attached and/or attachable to at least one external face of the second bag section, the attachment being such that, the second bag section is separable in use from the first bag section and can be withdrawn through the mouth, without compromising the seal of the second bag portion

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In a particularly preferred embodiment the plastic bag further comprises:

- v) a closure flap overlying and closing the mouth and including:
  - a) a first attached region which is peelably attached to the first wall such that at least a portion of the closure flap may be peeled away from the first wall across the peelably attached region to reveal the mouth, and a second attached region spaced from the peelably attached region in which second region the closure flap is also attached to the first wall, or,
  - b) a first region which is attached to the first wall, the closure flap including at least one line of weakness defining a tearable portion of the closure flap within which tearable portion the closure flap is not attached to the first wall and which tearable portion can be opened by tearing along the line of weakness to reveal the mouth; and a second attached region spaced from the tearable portion in which second region the closure flap is also attached to the first wall.

The second bag section may be sealed after filling preferably by heat sealing the third and fourth walls together in the closeable region.

5 In a particularly preferred construction, for attachment of the first bag section to the second bag section, an internal face of at least one of the respective first and second walls of the first bag section is attachable to at least one external face of the second bag section by heat sealing in the closeable region. Preferably in this construction at least one of the internal faces of the first and second walls and the external faces of the second bag section comprises a treated area in the closeable region, the treated area being effective to limit the strength of the heat seal between the first and second bag sections. The treated area preferably comprises printed areas, the printed areas being resistant to heat sealing. Preferably the treated area comprises alternate printed and non printed areas. The area of the printed areas is preferably greater than the area of the non-printed areas and preferably also the printed areas define stripes across the closeable region. Typically, the non-printed areas have a width of not more than about 2mm. Typically also the printed areas have a width of not more than about 10mm.

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20 In an alternative construction the treated area may comprise an embossed area of one or more of the walls.

25 In another preferred embodiment the first bag section is adhered to the second bag section proximate the open end of the second bag section. This may be as an alternative, or in addition, to the heat sealing defined above. Preferably the first bag section is adhered to the second bag section at marginal portions of the closeable region.

30 In another particularly preferred embodiment the plastic bag further comprises a second closeable mouth defined in the third or fourth wall for access in use to the interior of the second bag section.

Preferably in this embodiment the plastic bag further comprises:

- vi) a second closure flap overlying and closing the second mouth and including:
  - c) a first attached region which is peelably attached to the third or fourth wall such that at least a portion of the closure flap may be peeled away from the third or fourth wall across the peelably attached region to reveal the mouth, and a second attached region spaced from the peelably attached region in which second region the closure flap is also attached to the third or fourth wall, or,
  - d) a first region which is attached to the first wall, the closure flap including at least one line of weakness defining a tearable portion of the closure flap within which tearable portion the closure flap is not attached to the first wall and which tearable portion can be opened by tearing along the line of weakness to reveal the mouth; and a second attached region spaced from the tearable portion in which second region the closure flap is also attached to the first wall.

According to a second aspect of the invention there is provided a method of handling a product comprising:

- i) providing a bag as defined in the first aspect of the invention;
- ii) filling the second bag section with the flowable product through the open end of the bag; and
- iii) applying heat sealing means to the closeable region thereby to heat seal the third and fourth walls together to close the second bag section and to heat seal the first and/or second walls to the third and/or fourth walls to attach first and second bag portions together.

Preferably the method further comprises:

- iv) opening the closeable mouth in the first wall
- v) separating the first bag section from the second bag section in the closeable region; and
- vi) withdrawing the second bag section through the open mouth of the first wall.

According to a third aspect of the invention there is provided a plastic bag comprising:

- 5 i) a first bag section comprising first and second opposed walls joined at their edges;
- ii) a product-containing second bag section disposed within the first bag section and comprising second and third opposed walls joined at their edges;
- 10 iii) a closeable mouth defined in the first wall for access in use to the interior of the first bag section;
- iv) a sealing region distinct from the mouth including an end portion of the first bag section and an end portion of the second bag section within which sealing region the second bag section is sealed after filling the second bag section with product;

15 wherein, in the sealing region, internal faces of the third and fourth walls are heat sealed to close the second bag section and at least one of the respective first and second walls of the first bag section is attached to at least one of the external faces of the respective third and fourth walls of the second bag section, the attachment being such that, the second bag section is separable from the first bag section and can be withdrawn through the mouth, without compromising the seal of the 20 second bag portion.

25 Preferably in this third aspect, the respective first and second walls of the first bag section are attached to at least one of the external faces of the respective third and fourth walls of the second bag section by means of a heat seal formed contemporaneously with the heat seal which seals the third and fourth walls.

30 Preferably also at least one of the internal faces of the first and second walls and the external faces of the third and fourth walls comprises a treated area in the closeable region, the treated area being effective to limit the strength of the heat seal between the first and second bag sections.

For a better understanding of the invention and to show how the same may be carried into effect reference will be made, by way of example only, to the following drawings, in which:

5 Figure 1 is a partially cut away plan view of a bag according to the invention;

Figure 2 is a cross-section along the line II-II of Figure 1;

10 Figure 3 is a partially cut away plan view of the bag of Figure 1 from the reverse side; and

Figure 4 is a simplified plan view of an alternative construction of the closure flap of the bag of the invention.

15 Referring now to the drawings, the bag 2 of the invention comprises a first bag section 4 defined by first and second opposed walls 10, 12 and a second bag section 14 defined by third and fourth opposed walls 16, 18. The second bag section 14 lies within the first bag section 4. The first bag section 4 is closed on opposed side edges 20 and lower end edge 22 by suitable means for joining the first and second walls 20 together, such as adhesive or, more preferably, heat welding or heat sealing. Similarly, the second bag section 14 is closed on opposed side edges 24 and lower end edge 26 by suitable means for joining the third and fourth walls together. Alternatively, the respective first and second walls and third and fourth walls may be formed integrally, as a flattened tube. At end 28 the first and second walls 10, 12 are 25 not joined to each other. The third and fourth walls 16, 18 define an open end of the bag 30, the walls 16, 18 also not being joined to each other at this end. In the figures, the ends 28, 30 are shown slightly displaced from one another, for clarity of illustration. Preferably, however, the ends 28, 30 lie essentially along the same notional line.

First wall 10 includes a mouth 32 which preferably takes the form of a slit formed in the first wall 10. The mouth 32 may initially be in the form of a line of weakness, such as a line of perforations, which is breached when required to form the mouth 32. Most preferably, a closure flap 34 is provided on the first wall 10. The closure flap 5 34 lies over, and so closes, the mouth 32. The closure flap 34 is affixed to the first wall 10 in region 36 preferably by a suitable adhesive. The adhesive may be permanent so that the closure flap 34 and the first wall are not separable in region 36. The closure flap 34 is also attached to the first wall 10 in region 38. Region 38 is 10 such that the closure flap 34 may be peeled away from the first wall 10 across the region 38 without substantially or significantly damaging the first wall 10. Region 38 may be a welded or heat sealed region but is most preferably at least one region of peable adhesive. It is most preferable that the region 38 extends between the side edges 20 without interruption. In the illustrated embodiment, region 38 comprises a single line of peable adhesive. In alternative constructions, a plurality, especially 15 two or three, lines of peable adhesive may be provided. A corresponding region of peable adhesive (not illustrated) may be provided on the opposite side of the mouth 32 from region 38. A line of weakness 40 is provided at one side of the closure flap 34 and a corresponding line of weakness (not illustrated) is provided at the other side of the closure flap. For access to the mouth 32, the closure flap 34 is torn along the 20 lines of weakness 40 and peeled back through the region 38 to reveal the mouth 32. Numerous alternative constructions for the lines of weakness 40 are possible. For example, the lines of weakness could be curved or at an angle with respect to the side edges 20, or a single line of weakness 40 in the form of an arc extending from the leading edge 34a of the closure flap 34 above the region 38 and the mouth 32 and 25 returning to the leading edge 34a at the other side of the closure flap 34.

In preferred constructions of the bags according to the invention, the second bag section 14 is adhered to the first bag section 4 with an adhesion sufficient to maintain the desired relative positions of the bag section 4, 14 but not sufficient to prevent 30 easy separation of the bag sections when required. Thus, for example, an external face of the third wall 16 may be provided with a line of adhesive adjacent the open

end 30 by means of which the third wall is adhered to an internal face of the first wall 10. Similarly, an external face of the fourth wall 18 may be provided with a line of adhesive adjacent the open end 30 by means of which the fourth wall 18 is adhered to an internal face of the second wall 12.

5

The bags of the invention are provided with a closeable region 42 which can extend from above the mouth towards the ends 28, 30 of the first and second bag sections 4, 14. The actual extent of the closeable region 42 can be determined in accordance with the manufacturer's wishes but it is essential that the closeable region 42 does not encompass the mouth 32. Within the closeable region, heat sealing means can be applied to the bag whereby the internal faces of the third and fourth walls 16, 18 are heat sealed together, whereby the second bag section 14 is closed after having been filled with contents.

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15 The heat sealing step for sealing together the third and fourth walls 16, 18 is also effective in securely attaching the first bag section 4 to the second bag section 14. This is achieved in accordance with the invention in such a way that the bag section 4, 14 are sufficiently securely attached to prevent them from being separated in normal transport and handling but not so securely that the bag sections 4, 14 cannot 20 be separated manually when desired.

It will normally be expected that simple application of a heat seal which joins the first wall 10 to the third wall 16 and the second wall 12 to the fourth wall 18 will result in a joint between the respective walls which will be of a strength such that the first bag portion 4 is not easily separable when required from the second bag portion 14. In this respect, the choice of materials for the first, second, third and fourth walls 10, 12, 16, 18 can affect the strength of the heat seal and it is possible, for example, to achieve a heat seal of the desired strength by selecting materials respectively for the first and third and for the second and fourth walls whose compatibility for heat 30 sealing is poor. In this way, the strength of the resultant heat seal is not too great and so the first bag section 4 can be separated from the second bag section 14 when

required. The choice of materials in this respect is within the skill and knowledge of the person skilled in the art.

However, in preferred embodiments of the invention, at least one of the first, second, 5 third and fourth walls, 10, 12, 16, 18 is provided with a treated area 44 which interferes with the heat seal so limiting or reducing its strength to an extent that the first and second bag portions 4, 14 can be separated when required. The treated area 44 is preferably provided on an internal surface of the first and second walls 10, 12 or on an external surface facing the internal surface of the walls 10, 12, such as external 10 surfaces of the third and fourth walls 16, 18.

The treated area 44 can take any reasonable form known to the person skilled in the art for appropriately weakening the heat seal in the closeable region (that is, the heat seal other than that between the internal surfaces of the third and fourth walls) 15 provided that other features of the bag are not adversely affected. For example, the first and second walls 10, 12 or the third and fourth walls 16, 18 may be provided with an embossed region which interferes with the heat seal.

Most preferably, however, the treated area 44 is a printed area. The treated area 44 is 20 preferably not printed across the whole area. Rather, the treated area preferably comprises printed regions and non-printed regions. The relative areas of the printed and non-printed regions will determine the strength of the resultant heat seal, that is, in general terms, the greater the area of the printed regions, the weaker will be the heat seal. Preferably, the treated area comprises alternate printed and non-printed 25 regions, for example in the form of alternating stripes which may be arranged, for example, diagonally with respect to side edges 20. The relative areas of the printed and non-printed regions in any given bag of the invention can be determined by simple experiment by the person of ordinary skill in the art, in order to achieve an effective bond strength of the heat seal. Typically, relatively wide printed regions 30 will alternate in the treated area 44 with relatively narrow non-printed regions.

In use of the bags according to the invention, the second bag section 14 is first filled with the product to be contained in the bag 2 through the open end 30. When the desired amount of product has been placed in the second bag section 14, the bag is closed by heat sealing in the closeable region 42. That is, the heat sealing in the 5 closeable region 42 seals together the third and fourth walls 16, 18 whereby the product is prevented from escaping from the second bag section 14. In the same sealing step, the first and second bag sections are joined together with a heat seal, in the treated area, between the internal surfaces of the first and second walls 10, 12 and external surfaces of the second bag section 14. It is noted that this heat sealing may 10 be in addition to an initial adhesion of the first and second bag sections sufficient to retain the bag sections together before and during filling. The heat sealing in the treated area 44 may, for example, form a joint between the first and third walls 10, 16 and the second and fourth walls 12, 16. After the heat sealing step, the bag and its contents may be stored or transported as required. When access is required to the 15 contents of the bag, the mouth 32 in the first wall 10 is opened. In accordance with the illustrated embodiment, the closure flap 34 is peeled back through the region 38 by tearing along the lines of weakness 40 to reveal the mouth 32. The first and second bag sections 4, 14 are then separated by breaking apart the heat seal in the treated area 44 between the bag sections 4, 14. The second bag section 14 is then 20 withdrawn through the mouth 32 of the first bag section 4. At this stage, the heat seal between the third and fourth walls of the bag section remains intact so that the contents continue to be retained in the second bag section 14. The second bag section 14 may then be opened as desired to access the contents.

25 In a much preferred embodiment the second bag section 14 is also provided with a mouth 132 and a closure flap 134 overlying and closing the mouth 132. The construction of the closure flap 134 is essentially the same as that of the closure flap 34. Thus, the closure flap 134 is preferably permanently adhered to the second bag section 14 in region 136 and is peelably adhered to the second bag section 14 in region 138. The closure flap 134 is also provided with lines of weakness 140. Thus, 30 after extraction of the second bag section 14 from the first bag section 4 through

mouth 32, the second bag section 14 can be opened by tearing the closure flap 134 along the lines of weakness 140 and peeling back through the peelably attached region 138 to reveal the mouth 132, through which the contents of the second bag section 14 may be dispensed. As for the mouth 32, the mouth 132 may initially be 5 formed as a line of weakness such as a perforation which is breached to form the open mouth 132.

The closure flap 134 and mouth 132 may preferably be disposed on the fourth wall of the second bag section, that is so that the closure flap 134 and mouth 132 are 10 arranged on the wall of the second bag portion which is distant from the mouth 32 and closure flap 34. In this construction, the treated area 44 is formed on a region of the second closure flap 134 on its face juxtaposed with the fourth wall. The treated area 44 on the closure flap 134 is most preferably in addition to the treated area 44 formed on the third wall 16 in juxtaposition to the first wall 10.

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As can be seen from Figure 2, the closeable region in the preferred constructions of the bag according to the invention encompasses the third and fourth walls 16, 18, the first and second walls 10, 12 and the first and second closure flaps 34, 134.

20

Figures 2 and 3 illustrate the mouth 132 and closure flap 134 at the top portion of the bag, approximately adjacent the open end 30. This construction is preferred but not essential. The mouth 132 may be formed in any part of the third or fourth wall 16, 18 other than the closeable region, and the closure flap 134 is positioned accordingly on the third or fourth wall 16, 18 so that the mouth 132 is closed. In these 25 constructions, the closure flap 134 may be placed entirely outside the closeable region 42.

In alternative constructions, the fourth wall 18 may be made shorter than the third wall 16 so that the mouth 132 is defined by an upper end edge of the fourth wall 18.

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The closure flap is then peelably attached to the fourth wall 18 in region 138 only with the remainder of the closure flap 134 directly overlying the internal face of the

third wall 16. In effect, the upper portion of the closure flap becomes an extension of the fourth wall 18. In this construction the heat seal which closes the second bag portion to retain the contents therein is made between the third wall 16 and the closure flap 134, but not with any part of the fourth wall 18. References herein to 5 forming a heat seal between the third and fourth walls 16, 18 should be construed accordingly to include this construction, unless the context specifically requires otherwise. a similar construction is possible with respect to the closure flap 34 and the first wall 10 in that the first wall 10 may be made shorter than the second wall 12 so that the closure flap 34 is adhered to the first wall 10 only in region 38 with the 10 upper part of the closure flap 34 directly overlying the third wall 16. The upper part of the closure flap 34 then acts in effect as an extension of the first wall 10 and is heat sealed in use to the treated area 44 on the third wall 16, in the closeable region 42. References to portions of the first wall in the closeable region and/or the interaction of the first wall with the treated area should be construed accordingly.

15

Figure 4 illustrates an alternative construction of the closure flap which may be applied to either of the closure flaps 34 and 134. This construction achieves the same result as the construction illustrated in Figures 1 to 3 but does not require a peelable adhesive. In the construction of Figure 4 the closure flap 234 includes a line of 20 weakness 240 extending in a curved line on either side of the mouth. Other lines of weakness are possible such as "V" or "U" shapes. An area 200 is thus bounded by the line of weakness 240 and within this area the closure flap 234 is not adhered at all to the underlying wall (10, 12, 16, 18). Outside the area 200, in area 202 the closure 25 flap 234 is adhered, welded or otherwise bonded to the underlying wall to form a closure over the mouth 232. To this end, heat sealing or adhering of the closure flap 234 around its marginal edges is shown at 204 in Figure 4. The relevant bag portion 4, 14 may thus be opened by tearing the closure flap 234 along the line of weakness 240 to reveal the mouth 232.

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**Claims:**

1. A plastic bag comprising:

- 5      i) a first bag section comprising first and second opposed walls joined at their edges;
- ii) a second bag section disposed within the first bag section and comprising second and third opposed walls joined at their edges and an open end by means of which the second bag portion may be filled with contents;
- 10     iii) a closeable mouth defined in the first wall for access in use to the interior of the first bag section;
- iv) a closeable region distinct from the mouth including an end portion of the first bag section and an end portion of the second bag section proximate the open end of the second bag section, within which closeable region the second bag section may be sealed after filling;

15     wherein, in the closeable region, an internal face of at least one of the respective first and second walls of the first bag section is attached and/or attachable to at least one external face of the second bag section, the attachment being such that, the second bag section is separable in use from the first bag section and can be withdrawn through the mouth, without compromising the seal of the second bag portion

2. A plastic bag as claimed in claim 1 further comprising:

- v) a closure flap overlying and closing the mouth and including:
  - a) a first attached region which is peelably attached to the first wall such that at least a portion of the closure flap may be peeled away from the first wall across the peelably attached region to reveal the mouth, and a second attached region spaced from the peelably attached region in which second region the closure flap is also attached to the first wall; or,
  - b) a first region which is attached to the first wall, the closure flap including at least one line of weakness defining a tearable portion of the closure flap within which tearable portion the closure flap is not attached to the first wall and which

tearable portion can be opened by tearing along the line of weakness to reveal the mouth; and a second attached region spaced from the tearable portion in which second region the closure flap is also attached to the first wall.

- 5 3. A plastic bag as claimed in claim 1 or 2 wherein the second bag section may be sealed after filling by heat sealing the third and fourth walls together in the closeable region.
- 10 4. A plastic bag as claimed in claim 1, 2 or 3 wherein, for attachment of the first bag section to the second bag section, an internal face of at least one of the respective first and second walls of the first bag section is attachable to at least one external face of the second bag section by heat sealing in the closeable region.
- 15 5. A plastic bag as claimed in claim 4 wherein at least one of the internal faces of the first and second walls and the external faces of the second bag section comprises a treated area in the closeable region, the treated area being effective to limit the strength of the heat seal between the first and second bag sections.
- 20 6. A plastic bag as claimed in claim 5 wherein the treated area comprises printed areas, the printed areas being resistant to heat sealing.
7. A plastic bag as claimed in claim 6 comprising in said treated area alternate printed and non printed areas.
- 25 8. A plastic bag as claimed in claim 6 or 7 wherein the area of the printed areas is greater than the area of the non-printed areas.
9. A plastic bag as claimed in any of claims 6 to 8 wherein the printed areas define stripes across the closeable region.

30

10. A plastic bag as claimed in claim 7, 8 or 9 wherein the non-printed areas have a width of not more than about 2mm.

11. A plastic bag as claimed in any of claims 7 to 10 wherein the printed areas have a width of not more than about 10mm.

12. A plastic bag as claimed in claim 5 wherein the treated area comprises an embossed area of one or more of the walls.

10 13. A plastic bag according to any preceding claim wherein the first bag section is adhered to the second bag section proximate the open end of the second bag section.

14. A plastic bag as claimed in claim 13 wherein the first bag section is adhered to  
15 the second bag section at marginal portions of the closeable region.

15. A plastic bag as claimed in any preceding claim further comprising a second closeable mouth defined in the third or fourth wall for access in use to the interior of the second bag section.

20 16. A plastic bag as claimed in claim 15 further comprising:  
vi) a second closure flap overlying and closing the second mouth and including:

25 c) a first attached region which is peelably attached to the third or fourth wall such that at least a portion of the closure flap may be peeled away from the third or fourth wall across the peelably attached region to reveal the mouth, and a second attached region spaced from the peelably attached region in which second region the closure flap is also attached to the third or fourth wall, or,  
d) a first region which is attached to the first wall, the closure flap including at least one line of weakness defining a tearable portion of the closure flap within which tearable portion the closure flap is not attached to the first wall and

which tearable portion can be opened by tearing along the line of weakness to reveal the mouth; and a second attached region spaced from the tearable portion in which second region the closure flap is also attached to the first wall.

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17. A bag as claimed in claim 16 when dependent on claim 5 or on any claim dependent on claim wherein the treated area is formed on the second closure flap.

18. A method of handling a flowable product comprising:

- 10 i) providing a bag as claimed in any of claims 1 to 16;
- ii) filling the second bag section with the flowable product through the open end of the bag; and
- 15 iii) applying heat sealing means to the closeable region thereby to heat seal the third and fourth walls together to close the second bag section and to heat seal the first and/or second walls to the third and/or fourth walls to attach first and second bag portions together.

19. A method as claimed in claim 18 further comprising:

- iv) opening the closeable mouth in the first wall
- 20 v) separating the first bag section from the second bag section in the closeable region; and
- vi) withdrawing the second bag section through the open mouth of the first wall.

20. A plastic bag comprising:

- 25 i) a first bag section comprising first and second opposed walls joined at their edges;
- ii) a product-containing second bag section disposed within the first bag section and comprising second and third opposed walls joined at their edges;
- 30 iii) a closeable mouth defined in the first wall for access in use to the interior of the first bag section;

iv) a sealing region distinct from the mouth including an end portion of the first bag section and an end portion of the second bag section within which sealing region the second bag section is sealed after filling the second bag section with product;

5 wherein, in the sealing region, internal faces of the third and fourth walls are heat sealed to close the second bag section and at least one of the respective first and second walls of the first bag section is attached to at least one of the external faces of the respective third and fourth walls of the second bag section, the attachment being such that, the second bag section is separable from the first bag section and can be withdrawn through the mouth, without compromising the seal of the second bag portion.

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21. A plastic bag as claimed in claim 20 wherein the respective first and second walls of the first bag section are attached to at least one of the external faces of the

15 respective third and fourth walls of the second bag section by means of a heat seal formed contemporaneously with the heat seal which seals the third and fourth walls.

22. A plastic bag as claimed in claim 21 wherein at least one of the internal faces of the first and second walls and the external faces of the third and fourth walls comprises a treated area in the closeable region, the treated area being effective to limit the strength of the heat seal between the first and second bag sections.

20

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23. A plastic bag substantially as hereinbefore described with reference to any of

25 Figures 1 to 4.

**Abstract****Improvements in Bags and Sacks**

5 The invention relates to plastic bags and sack for use especially in the food and pharmaceutical industries. The bag comprises inner and outer bag portions which are joined at an upper portion in a manner which allows them to be separated when required, such as by heat sealing. The outer bag portion is provided with a mouth through which the inner bag portion can be withdrawn when required. The inner bag

10 portion is heat sealed after filling with contents to retain the contents in the inner portion. The heat sealing step also serves to secure the bag portions together as above. The inner bag portion is preferably provided with a closeable mouth separate from the end by which it is filled, through which the contents may be dispensed.

15 Figure 1

1/2

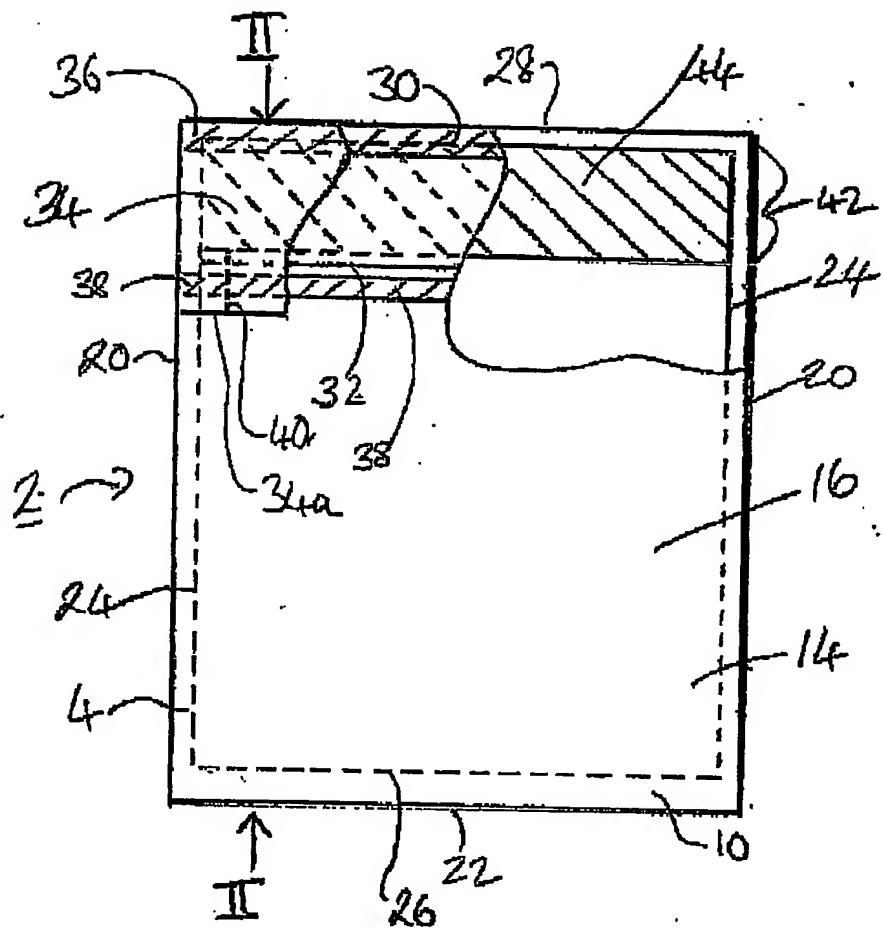


Figure 1

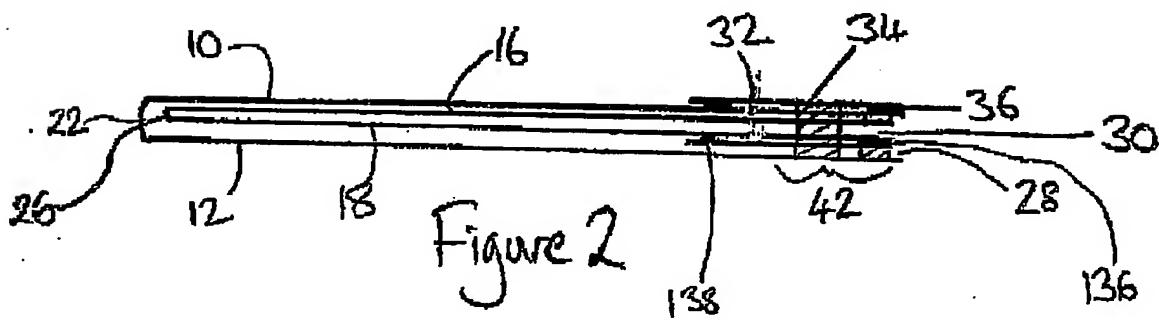


Figure 2

22

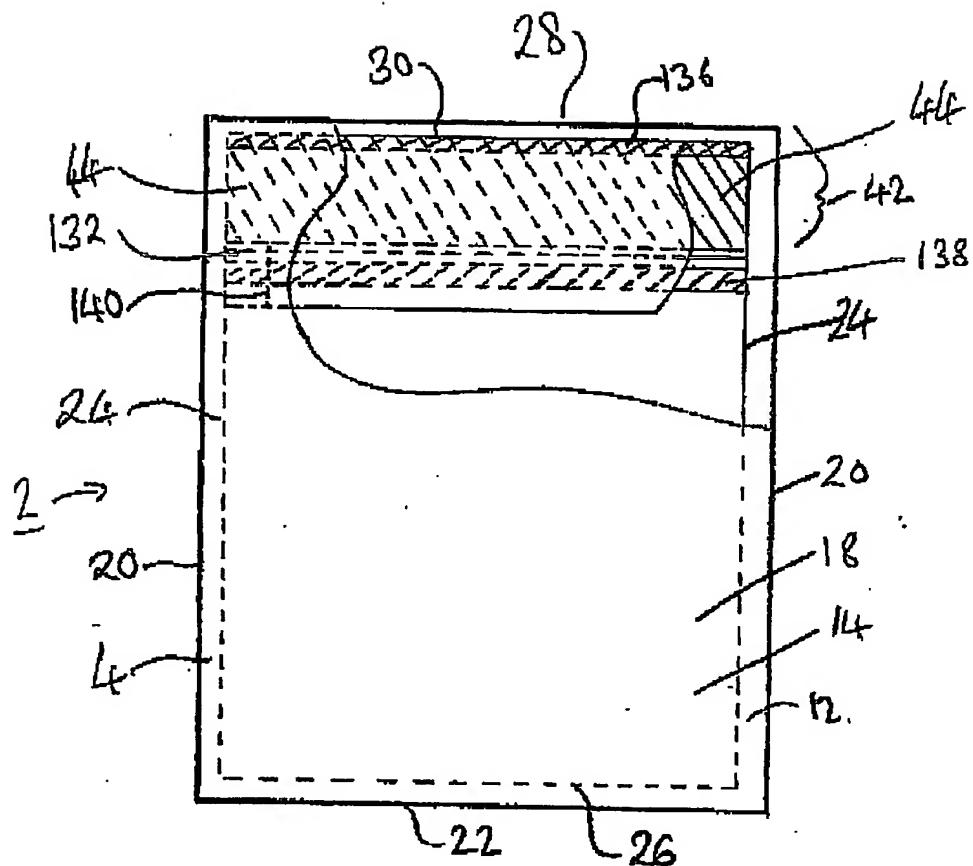


Figure 3

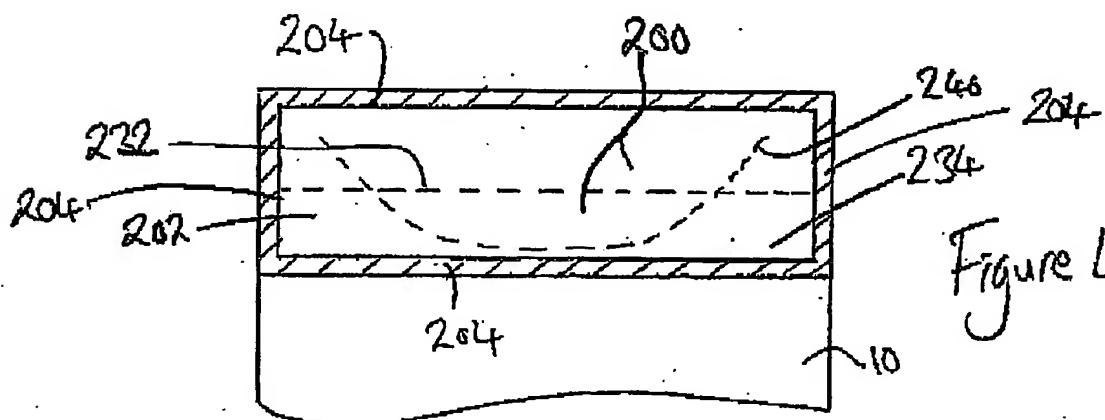


Figure 4

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